

**Notice of Allowability**

Application No.

09/898,340

Examiner

Tarifur R Chowdhury

Applicant(s)

KATAOKA, SHINGO

Art Unit

2871

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed on 11/8/04.
  2. ☒ The allowed claim(s) is/are 1,5,6 and 8-12.
  3. ☒ The drawings filed on 03 July 2001 and 12 June 2003 are accepted by the Examiner.
  4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|   | 9. <input type="checkbox"/> Other _____   |

***Allowable Subject Matter***

1. Claims 1, 5, 6 and 8-12 are allowed.
2. The following is an examiner's statement of reasons for allowance:
3. As to claims 1, 5 and 11, the prior arts of record do not anticipate or render obvious to one skilled in the art a liquid crystal display device or a method of producing such a device comprising various elements as claimed, more specifically a liquid crystal layer containing nematic liquid crystal molecules and a cured- product formed three-dimensionally of a composition having a liquid crystal skeletal structure, wherein deformation of the liquid crystal layer is at least spray deformation or bend deformation and the concentration of the composition is determined so as to satisfy the following relation when a mean value of an angle described between the liquid crystal skeletal structure and the first substrate in a polar angle direction is  $\alpha$ , pre-tilt angles of the liquid crystal molecules on interfaces of the first and second substrates are  $\beta_1$  and  $\beta_2$ , respectively, and a mean value of an angle between the liquid crystal molecules and the first substrate is  $\theta$ :

at the time of non-application of a voltage;

when dielectric anisotropy of the liquid crystal molecules is negative,

$$\alpha < \theta < (\beta_1 + \beta_2)/2; \text{ and}$$

when dielectric anisotropy of the liquid crystal molecules is positive,

$$(\beta_1 + \beta_2)/2 < \theta < \alpha.$$

4. As to claims 8, 10 and 12, the prior arts of record do not anticipate or render obvious to one skilled in the art a liquid crystal display device or a method of producing

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such a device comprising various elements as claimed, more specifically a liquid crystal layer containing nematic liquid crystal molecules and a cured- product formed three-dimensionally of a composition having a liquid crystal skeletal structure, wherein deformation of the liquid crystal layer is at least spray deformation or bend deformation and the concentration of the composition is from 0.3 to 3 wt% or determined and satisfies the following relation when a mean value of an angle described between the liquid crystal skeletal structure and the first substrate in a polar angle direction is  $\alpha$ , pre-tilt angles of the liquid crystal molecules on interfaces of the first and second substrates are  $\beta_1$  and  $\beta_2$ , respectively, and a mean value of an angle between the liquid crystal molecules and the first substrate is  $\theta$ :

at the time of non-application of a voltage;

when dielectric anisotropy of the liquid crystal molecules is negative,

$$(\beta_1 + \beta_2)/2 - \theta < \theta - \alpha ; \text{ and}$$

when dielectric anisotropy of the liquid crystal molecules is positive,

$$\theta - (\beta_1 + \beta_2)/2 < \alpha - \theta.$$

The closest references USPAT 6,256,082 and EP 0768562 disclose a liquid crystal display device comprising a liquid crystal layer containing nematic liquid crystal molecules and a cured- product formed three-dimensionally of a composition having a liquid crystal skeletal structure, wherein deformation of the liquid crystal layer is at least spray deformation or bend deformation. However, none of the prior arts alone or in combination teach or suggest the claimed liquid crystal display device satisfying the claimed relationships between  $\alpha$ ,  $\beta_1$  and  $\beta_2$  and  $\theta$ .

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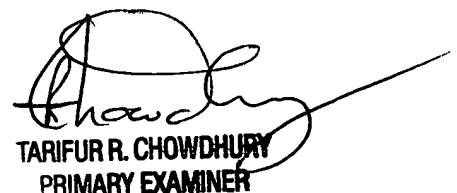
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (571) 272-2287. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TRC  
January 04, 2005



TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER